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EXAMINER	
WANG, QUAN ZHEN	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/986,057	CHRISTOPHER, PAUL F.	
	Examiner	Art Unit	
	Quan-Zhen Wang	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/28/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1).

Regarding claim 1, Mendenhall et al. teach a satellite communication system comprising: a terrestrial base station (fig. 1B, 26); and a first satellite (fig. 1B, 10) communicating with said terrestrial base station using an infrared signal (optical beam, column 6, lines 63-64).

Regarding claim 15, Mendenhall et al. teach a terrestrial base station communication system comprising: a terrestrial based station (fig. 1B, 26) communicating with a first satellite (fig. 1B, 10) using an infrared signal (optical beam, column 6, lines 63-64).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 2-3, 7, 9-10, 14, 16-17, 21, 23-24, 28-29, 36-39, 46-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1).

Regarding claims 2-3 and 9-10, Mendenhall et al. teach a satellite communication system includes transmitting infrared signal (optical beam, column 6, lines 63-64) between the terrestrial base station (fig. 1B, 26) and the first satellite (fig. 1B, 10). Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically teach that the optimal location for transmitting the infrared signal is determined based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency. However, Badesha et al. disclose that clouds, rain, and fog can scatter optical beam energy and disrupt communications (page 1, paragraph 0005, lines 8-10). Badesha et al. further teach that one approach to mitigate the problem is to have several ground stations at different locations so that a transmission can be sent from the ground station that is least obstructed (optimal location) by clouds (page 1, paragraph 0006). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location for transmitting and receiving the infrared signal based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency to provide a reliable communication capability.

Regarding claims 7 and 14, Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically teach to determine an optimal location based

on the probability function of an elevation angle. However, Badesha et al. disclose that there are significant problems associated with the operation of optical communication systems in the atmosphere (page 1, paragraph 0005, lines 6-8). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location based on the probability function of an elevation angle to reduce the distance for an optical signal to travel in the atmosphere.

Regarding claims 16-17 and 23-24, Mendenhall et al. disclose a terrestrial base station communication system includes transmitting infrared signal (optical beam, column 6, lines 63-64) between the terrestrial base station (fig. 1B, 26) and the first satellite (fig. 1B, 10). Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically disclose that the optimal location for transmitting the infrared signal is determined based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency. However, Badesha et al. disclose that clouds, rain, and fog can scatter optical beam energy and disrupt communications (page 1, paragraph 0005, lines 8-10). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location for transmitting the infrared signal based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency.

Regarding claims 21 and 28, Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically disclose to determine an optimal location based on the probability function of an elevation angle. However, Badesha et al. point out that there are significant problems associated with the operation of optical

communication systems in the atmosphere. (page 1, paragraph 5, lines 6-8). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location based on the probability function of an elevation angle to reduce the distance for an optical signal to travel in the atmosphere.

Regarding claims 29 and 39, Mendenhall et al. teach a satellite communication system includes transmitting infrared signal (optical beam, column 6, lines 63-64) between the terrestrial base station (fig. 1B, 26) and the first satellite (fig. 1B, 10). Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically teach the method for determining an optimal location for transmitting and receiving an infrared in a region. However, Badesha et al. teach that there are significant problems associated with the operation of optical communication systems in the atmosphere (page 1, paragraph 0005), because the clouds, fog can absorb and scatter the optical beam. Badesha et al. further teach that one approach to mitigate the problem is to have several ground stations at different locations so that a transmission can be sent from the ground station that is least obstructed by clouds (page 1, paragraph 0006). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location for transmitting and receiving the infrared signal to provide a reliable transmission capability.

Regarding claims 36-38, and 46-48, Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically disclose to determine an optimal

location based on the probability function of an elevation angle. However, Badesha et al. disclose that there are significant problems associated with the operation of optical communication systems in the atmosphere. (page 1, paragraph 0005, lines 6-8). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location based on the probability function of an elevation angle to reduce the distance for an optical signal to travel in the atmosphere.

Regarding claims 49-51, Mendenhall et al. disclose a satellite communication system includes transmitting infrared signal (optical beam, column 6, lines 63-64) between the terrestrial base station (fig. 1B, 26) and the first satellite (fig. 1B, 10). Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically disclose that the optimal location for transmitting and receiving the infrared signal is determined based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency; and the attenuation is based one the cloud water content persistent in the region. However, Badesha et al. point out that clouds, rain, and fog can scatter optical beam energy and disrupt communications (page 1, paragraph 5, lines 8-10). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to determine an optimal location for transmitting and receiving the infrared signal based on a frequency of the infrared signal and the attenuation of the infrared signal at the frequency and locate the terrestrial station at the optimal location to provide a reliable communication capability.

Claims 4, 11, 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) and further in view of Mesecher (U.S. Patent US 6,603,800 B1).

Regarding claims 4, 11, 18, and 25, Mendenhall et al. and Badesha et al. differ from the claimed invention in that Mendenhall et al. and Badesha et al. do not specifically teach that an optimal location is defined by longitude and latitude. However, Mesecher teaches to describe the location of a base station using longitude and latitude (column 4, lines 54-55). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to define the optimal location by longitude and latitude in order to define the definitive location of the optimal location of the station using a recognized coordinate system.

3. Claims 5, 12, 19, 26, 30-35 and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) and further in view of Pfeiffer et al. (U.S. Patent US 5,960,097).

Regarding claims 5, 12, 19, 26, 30-35 and 40-45, Mendenhall et al. and Badesha differ from the claimed invention in that Mendenhall et al. and Badesha do not specifically teach to determine the cloud water content based on an exceedance probability. However, Pfeiffer et al. teach to use exceedance probability method to analyzing the influence of background clutter on a missile detection and tracking system

(column 11, line 67 to column 12, line 2). The problem is analog to the signal degradation of the satellite communication system by water content in the clouds. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply the exceedance probability method taught by Pfeiffer et al. to the system taught by Mendenhall et al. and Badesha et al. in order to analyze the influence of the clouds on the satellite signals.

4. Claims 6, 13, 20, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Badesha et al. (U.S. Patent Application Publication US 2002/0167702 A1) and further in view of Chu et al. (The Bell System Technical Journal, May-June 1968 Volume 47, Number 5, Page 723-759).

Regarding claims 6, 13, 20, and 27, Mendenhall et al. and Badesha differ from the claimed invention in that Mendenhall et al. and Badesha do not specifically teach to determine the cloud water content based on cloud water content formula. However, Chu et al. teach to use cloud water content formula (equations 9, and 12) to study the signal degradation caused by clouds. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply cloud water content formula to the system taught by Mendenhall et al. and Badesha et al. in order to analyze the influence of clouds on the satellite signals.

5. Claims 8 and 22 are rejected under 35 U.S.C. 103(a) as being anticipated by Mendenhall et al. (U.S. Patent US 6,535,314 A1 B1) in view of Ross et al. (U.S. Patent US 5,218,467).

Regarding claim 8 and 22, Mendenhall et al. teach a satellite communication system includes transmitting infrared signal (column 6, lines 63-64) between the terrestrial base station (fig. 1B, 26) and the first satellite (fig. 1B, 10). Mendenhall et al. differ from the claimed invention in that Mendenhall et al. do not specifically teach to include a second satellite, a third satellite, a fourth satellite, and a fifth satellite, and the first satellite, second satellite, and third satellite each being in a phased Molniya orbit, and the satellite communication system of claim 1, further comprising at least a fourth satellite and fifth satellite each being in a geosynchronous orbit. However, Ross et al. teach a satellite communication system have a geosynchronous satellite (fig. 1, 1) communicating with six Molniya (low earth) orbit satellites. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to include more than one geosynchronous satellites and plurality of Molniya (low earth) orbit satellites in the satellite communication system taught by Mendenhall et al. to increase the area that the satellite communication system covers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 8:30 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw

M. R. Sedighian

M. R. SEDIGHIAN
PRIMARY EXAMINER